



A.D. 1857 N° 1793.

S P E C I F I C A T I O N

OF

JOHN LLOYD.

UTILIZING AND DEODORIZING SEWAGE
MATTERS, &c.

L O N D O N :

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A.D. 1857 N° 1793.

Utilizing and Deodorizing Sewage Matters, &c.

LETTERS PATENT to John Lloyd, of Llangefui, in the County of Anglesea, M.D., for the Invention of “**IMPROVEMENTS IN UTILIZING AND DEODORIZING SEWAGE MATTERS OF DWELLING HOUSES AND OTHER PLACES, AND IN APPARATUS TO BE USED IN CONNEXION WITH THE SAME.**”

Sealed the 22nd December 1857, and dated the 26th June 1857.

PROVISIONAL SPECIFICATION left by the said John Lloyd at the Office of the Commissioners of Patents, with his Petition, on the 26th June 1857.

I, JOHN LLOYD, of Llangefui, in the County of Anglesea, M.D., do hereby
5 declare the nature of the said Invention for “**IMPROVEMENTS IN UTILIZING AND DEODORIZING SEWAGE MATTERS OF DWELLING HOUSES AND OTHER PLACES, AND IN APPARATUS TO BE USED IN CONNEXION WITH THE SAME,**” to be as follows:—

My Invention consists in applying the waste or refuse of fireplaces in
10 houses, &c., alone or in combination with lime, to correct or remedy the nuisance produced, especially by human excretions, and thereby reduce them to a harmless and inoffensive state, so as to be easily removeable with such refuse, and so to be used as manure, or for other purposes.

By the waste refuse I mean what is generally called the sifted ashes or
15 breeze, and more or less or the whole of the cinders at times, to be used either as they usually occur, or more or less ground or pounded, and either alone or combined with quick-lime in certain proportions, and assisted in certain circumstances by small quantities of the chloride of lime of commerce.

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The ashes and cinders are either to be used fresh daily, by being added, in a state of mixture with lime or not, to the closets or pans, to be again described, in quantities sufficient to cause all bad smell or noxious effluvia to cease, or if not used from the fires every morning, they are to be carefully preserved from wet in certain covered depôts, to be again described, and the excess of them 5 produced in winter is to be carefully reserved for summer in such depôts, which are either to be small ones attached to every house, or street, or block of houses, or large ones for whole towns and districts. In the same depôts, or other convenient places, I propose that the dry sewage thus produced shall be accumulated for sale or use, and also that the lime, which is useful for the 10 process, shall be either collected or burnt, and the vapours therefrom to assist in correcting any effluvia which may arise from a large collection or manipulation of such sewage matter. The proportion of lime which I propose to use with the ashes is one part to two, generally, but the proportion may be varied according to circumstances and localities, or omitted. The chloride of lime 15 will only be necessary in rare cases, and very small quantities.

The useful action of the substances above mentioned require certain changes in the closets, middens, necessaries, and cesspools now in common use. Where waterclosets, or night chairs, or privies are now used, it will not be necessary but prejudicial to use water at all, according to this plan, 20 the very principle of which is to get rid of all the water contained naturally in the excretions, and so prevent the possibility of putrefaction.

I propose to use inside of closets and night chairs, and beneath the seats of privies, metallic or other pans, of sizes convenient to be introduced and removed therefrom, and through passages, &c., when full. They will be 25 generally of a square shape, from a cubic foot upwards in dimensions, and divided by a curved or other shaped partition, in such a position, with regard to the circular opening of the seat, as effectually to separate the foeces and urine as they fall; a circumstance depending entirely upon anatomical considerations, and which acts in the case of women as well as men. The two 30 substances are therefore acted upon separately, which is of great importance, the posterior portion becomes exceedingly dry by the action of the fresh ashes and lime, and rapidly solidifies and even fossilizes the foeces, and converts them to dry masses or cakes, without any smell, and which can be compressed, pounded, or packed, as may be desired. It has also a great effect upon the 35 evaporation in the front compartment of the closet, and helps to remove the watery portion of the urine by evaporation.

The front compartment of the pan or closet I propose shall always, if possible, be nearly filled with the mixture of lime and ashes already mentioned.

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It acts in this manner: the quantity of urine passed into the closet forms a mass of wet lime, which acts in its well-known capacity of absorbing gases by deodorizing at once the natural offensive smell of the fresh foeces, which are afterwards rapidly fossilized.

5 A great part of the urine thus passed in the closet is at once absorbed, and any excess of it filters through the mass of lime and carbon through a pipe to the sewer, and by so doing, becomes divested of urea, uric acid, mucus, and nearly all foreign matters, passing off as lime water, with only a very small proportion of impurities, and in a state that the ordinary urinary putrefaction
10 and smell is rendered impossible. The lime separates spontaneously in the sewers, &c., or may be discharged artificially, along with most of the animal matter, by means of carbonic acid, and the deposit collected.

Lastly, I propose to apply the action of the materials now mentioned, on the same principle as in the front compartment of the closet, to the purification of
15 cesspools, and the urine and other liquids thrown away from bedrooms, wash-houses, kitchens, &c., by which means the great body of the solid matters contained in them are detained in the materials employed, and the remainder of such liquids filter through in such a state that they will not putrify or smell, or cause any nuisance. And I propose to act upon such liquids, either as they
20 pass from each house separately, or for a street, or block of houses, or for a whole town, by appropriate pipes, sinks, reservoirs, and means of transport suitable to the exigency of each locality and circumstance.

SPECIFICATION in pursuance of the conditions of the Letters Patent, filed
by the said John Lloyd in the Great Seal Patent Office on the 24th
25 December 1857.

TO ALL TO WHOM THESE PRESENTS SHALL COME, I, JOHN LLOYD, of Llangefui, in the County of Anglesey, M.D., send greeting.

WHEREAS Her most Excellent Majesty Queen Victoria, by Her Letters Patent, bearing date the Twenty-sixth day of June, in the year of our Lord
30 One thousand eight hundred and fifty-seven, in the twenty-first year of Her reign, did, for Herself, Her heirs and successors, give and grant unto me, the said John Lloyd, Her special licence that I, the said John Lloyd, my executors, administrators, and assigns, or such others as I, the said John Lloyd, my executors, administrators, and assigns, should at
35 any time agree with, and no others, from time to time and at all times thereafter during the term therein expressed, should and lawfully might

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make, use, exercise, and vend, within the United Kingdom of Great Britain and Ireland, the Channel Islands, and Isle of Man, an Invention for
“IMPROVEMENTS IN UTILIZING AND DEODORIZING SEWAGE MATTERS OF DWELLING
HOUSES AND OTHER PLACES, AND IN APPARATUS TO BE USED IN CONNECTION WITH
THE SAME,” upon the condition (amongst others) that I, the said John Lloyd, 5
my executors or administrators, by an instrument in writing under my, or
their, or one of their hands and seals, should particularly describe and
ascertain the nature of the said Invention, and in what manner the same
was to be performed, and cause the same to be filed in the Great Seal
Patent Office within six calendar months next and immediately after the 10
date of the said Letters Patent.

NOW KNOW YE, that I, the said John Lloyd, do hereby declare the
nature of the said Invention, and in what manner the same is to be per-
formed, to be particularly described and ascertained in and by the following
statement thereof, that is to say:— 15

My Invention consists in applying the waste or refuse of fireplaces in
houses, &c., alone or in combination with lime, to correct or remedy the
nuisance produced by the sewage of houses, especially by human excretions,
and thereby reduce them to a harmless and inoffensive state, so as to be
easily removeable with such refuse, and so to be used as manure, or for other 20
purposes.

By the waste refuse I mean what is generally called the sifted ashes or
breeze, and more or less or the whole of the cinders at times, to be used
alone when in sufficient quantities, and when urine and all other liquids are
separated from the fæces, either as they usually occur, or more or less ground 25
or pounded, and either alone or combined with quick-lime in certain propor-
tions, and assisted in certain circumstances by small quantities of the chloride
of lime of commerce.

In summer, mouldiness and the lavæ of insects are apt to be generated,
unless an addition of quick-lime, or chloride of lime, or other chloride, is made 30
to prevent it. The ashes also deodorize and practically solidify their own weight
of urine, slops, &c., by evaporation and absorption; but if the liquids are in
larger proportion, in the absence of lime, &c., they filter through, and although
greatly divested of urea and other important matters, they in time cause some
degree of smell, which the addition of lime entirely prevents. 35

The mixture is made in different proportions to suit circumstances. For
the back compartment it is generally better made an “intimate” mixture, but
for sinks, &c., the substances are better in layers or strata, or roughly mixed,
the upper layer to be of ashes alone, to absorb most of the urea before passing

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to the lime. The lime employed is preferable if burnt from the limestone called "dolomite," or such at least as contains an appreciable quantity of magnesia, with the view of detaining any ammonia that may be formed in the insoluble form, well known as ammoniaco-magnesian phosphate, produced
5 between the two substances, and the soluble phosphates of the urine; I depend chiefly, however, upon the prevention of all decomposition, (particularly with ordinary lime) by the rapid solidification and drying of both fæces and urine, or the solid contents thereof, in which state their chemical constituents do not act upon each other to cause putrefaction. The ashes may be assisted, in the
10 absence of quick-lime, or in case of any inconvenience arising from it, by the use of sulphate of lime (burnt), or even burnt clay. Any ammonia that possibly may be formed is, however, retained by the "wet lime," (as in gas-works,) or in the pores of the charcoal, and ultimately solidified, as in guano. Chloride of lime (solid) is, however, to be added in small quantities, if from
15 unusual circumstances any ammoniacal smell or putrefaction should occur. The ashes and cinders are either to be used fresh daily, by being added in a state of mixture with lime or not, to the closets or pans, to be again described, in quantities sufficient to cause all bad smell or noxious effluvia to cease, or if not used fresh from the fires every morning they are to be carefully preserved
20 from wet, in certain covered depôts, to be again described, and the excess of them produced in winter is to be carefully preserved for summer in such depôts, which are either to be small ones, attached to every house, or street, or block of houses, or large ones for whole towns and districts. In the same depôts, or other convenient places, I propose that the dry sewage thus pro-
25 duced shall be accumulated for sale or use, and also that the lime, which is useful for the process, shall be either collected or burnt, and the vapours therefrom to assist in correcting any effluvia which may arise from a large collection or manipulation of such sewage matter. The proportion of lime which I propose to use with the ashes is one part to two, generally, but the propor-
30 tion may be varied according to circumstances and localities, or omitted. The chloride of lime will only be necessary in rare cases, and very small quantities.

The useful action of the substances above mentioned requires certain changes in the closets, middens, necessaries, and cesspools now in common use. Where waterclosets, or night chairs, or privies are now used, it will not be
35 necessary but prejudicial to use water at all, according to this plan, the very principle of which is to get rid of all the water contained naturally in the excretions, and so prevent the possibility of putrefaction.

I propose to use inside of closets and night chairs, and beneath the seats of privies, metallic or other pans, of sizes convenient to be introduced and

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removed therefrom, and through passages, &c., when full. They will be generally of a square shape, from a cubic foot upwards in dimensions, and divided by a curved or other shaped partition, in such a position with regard to the circular opening of the seat as effectually to separate the fæces and urine as they fall; a circumstance depending entirely upon anatomical 5 considerations, and which acts in the case of women as well as men. The two substances are therefore acted upon separately, which is of great importance. The posterior portion becomes exceedingly dry by the action of the fresh ashes and lime, and rapidly solidifies and even fossilizes the fæces and converts them to dry masses or cakes without any smell, and which can 10 be compressed, pounded, or packed, as may be desired. It has also a great effect upon the evaporation in the front compartment of the closet, and helps to remove the watery portion of the urine by evaporation.

The front compartment of the pan or closet I propose shall always, if possible, be partially or nearly filled with the mixture of lime and ashes already 15 mentioned. It acts in this manner: the quantity of urine passed into the closet forms a mass of wet lime, which acts in its well-known capacity of absorbing gases by deodorizing the natural offensive smell of the fresh fæces, which are afterwards rapidly fossilized.

A great part of the urine thus passed in the closet is at once absorbed, and 20 any excess of it filters through the mass of lime and carbon, through a pipe to the sewer, and by so doing becomes divested of urea, uric acid, mucus, and nearly all foreign matters, passing off as lime water, with only a very small proportion of impurities, and in a state that the ordinary urinary putrefaction and smell is rendered impossible. The lime separates spontaneously in the 25 sewers, &c., or may be discharged artificially, along with most of the remaining animal matter, by means of carbonic acid, and the deposit collected.

Lastly, I propose to apply the action of the materials now mentioned, on the same principle as in the front compartment of the closet, to the purification of cesspools, and the urine and other liquids thrown away from bedrooms, wash- 30 houses, kitchens, &c., by which means the great body of the solid matters contained in them are detained in the materials employed, and the remainder of such liquids filter through in such a state that they will not putrify or smell, or cause any nuisance. And I propose to act upon such liquids either as they pass from each house separately, or for a street, or block of houses, or for a 35 whole town, by appropriate pipes, sinks, reservoirs, and means of transport suitable to the exigency of each locality and circumstance.

There are several forms of the closets by means of which I propose to carry out the principles above described under various circumstances. The simplest

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form will be a pan or vessel of zinc, or iron, or even wood, covered with a seat with a circular hole, as usual, and a quantity of the deodorizing material, so arranged inside of it as to form a kind of partition, the fæces falling behind and the urine before, and there absorbed.

5 The next form is a metallic or other vessel with a curved partition *a* (see Figures 1 and 2), so dividing the vessel and bisecting the circle of the seat, that all urine shall infallibly fall in front of the partition and all fæces behind, each to be therein acted upon by the materials, as already described. In this case the materials are added each time after the closet has been used by means
10 of a ladle, or large spoon resembling a basting spoon, or any other convenient instrument.

In the third form of closet the partition is straight, bisecting the circle of the seat as before, and rising up to a certain distance under the seat, where it is met by a flat broad valve *b*, Figures 3 and 4, which, when closed, meets the
15 partition from behind, and so closes mechanically upon all unpleasant appearances, and assists in preventing smell. Now this valve may be actuated either by a handle like that of an ordinary watercloset, or it may be self-acting, the motion being produced by the weight of the person using the closet acting upon springs in communication with multiplying levers and assisted by a
20 counterweight behind, as shewn in these Figures. In either case it is desirable to make it assist in introducing the deodorizing materials spontaneously, so as to avoid the effects of neglect arising from forgetfulness, or a feeling of delicacy, &c. I effect this object easily in the following manner:—Behind the axis on which the valve *b* works backwards and forwards, there
25 is another axis *c*, bearing a cylinder with several “pockets” *d* upon it. By means of two small cog wheels *e* and *f*, and a ratchet wheel *g*, the cylinder is made to revolve in one direction, and that only during the closure of the valve *b*. Behind and above the seat *h* is placed a box or feeder *i*, filled at proper times with the deodorizing material, and placed upon and above the
30 cylinder *d*, with which it communicates by an opening. The result is, that as the cylinder revolves, the deodorizing powder in the box falls down into the pan or receptacle of the closet, falling first into a pocket *j* behind the valve, by whose motion it is carried well forward into the closet; and a portion is even projected forward, if necessary, to the front compartment to deodorize
35 the urine, and keep down all noxious smell. The valve *b* is also useful in preventing dust, inasmuch as the ashes or mixture passes behind it as it closes, a little dust, however, rising in the front compartment, which is useful and effectual in correcting noxious smell. The quantity, however, of dust or coarse ashes, &c. can be regulated by the arrangements behind, so as to suit

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circumstances. Now as the front compartment of the closet in fact is a distinct and separate vessel, so it is sometimes useful to make it so in reality, as shewn in Figures 5 and 6, and sometimes joining the rims of the vessels by a flap of sheet lead. Over this compartment it is also generally useful to place a wire guard or kind of rack, one of which is shewn separately at 5 Figures 7 and 8, and which prevents all paper, &c. used falling into it, and made to go out of sight behind the valve each time it opens. Another important use of this valve, not yet mentioned, is to prevent all liquids thrown or passed into the closet getting to the back compartment, which would destroy the effect of the whole arrangement. The seat h it will 10 be seen turns upon a hinge at h^1 , and is constantly acted upon with a tendency to bear it upwards by springs h^2 . Upon being sat on, the seat h will be depressed, and act by the link n upon one end of the lever o , which turns upon a centre of motion o^1 , and at its other end is, by the connecting link o^2 , connected to the lever o^3 , which by the driver o^4 acts upon the 15 teeth of the ratchet wheel g to cause a partial rotation thereof, and thence to the cylinder a , at each of such times. The weight b^1 acts as a counterbalance to the valve b , for which purpose it is suspended from the arm b^2 affixed to the axis g^1 , upon which are also fixed other arms supporting the valve.

It now only remains to describe a plan for carrying out these principles on 20 a combined and comprehensive scale, and this is easier and shorter done by means of the two Drawings, Figures 9, 10, and 11, and Figure 12.

Figures 9, 10, and 11, show three views of means by which three principal closets, one on each story of a large house, may discharge the solid evacuations into one common receptacle below, where they are deodorized and solidified by 25 either of the methods before described. Pipes or tubes k , about an inch or two in diameter, admit of the overflow from front compartments of the closets when there is a separation in the closet, as shewn by Figures 1, 2, 5, & 6, or from sinks in connection therewith, the fall to take place from each closet without touching or soiling their sides. A self or hand acting closet 30 l , l^1 , or l^2 , being placed at the top of each channel t , u , v , sending down the deodorizing powder with the evacuation, or otherwise conveying the powder below, or ashes, &c. are added daily through the holes by manual labor. In these cases particularly, the front compartment is to be removable, and charged, either by hand or otherwise, with the deodorizer, and 35 also having an overflow pipe m , (Figures 1, 2, 5, & 6,) discharging to the solidifying sinks z in the back yard, the overflow from the latter, if any, finding its way to the sewers by the chambers 1, 2, 3, 4, 5, consecutively, in a perfectly harmless state. z^1 are openings of communication

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between the separate compartments 1, 2, 3, 4, 5; and z^2 , the discharge pipe. p is a depôt for ashes, which are supplied through the opening p^1 , when a separation of the smaller particles from the cinders is effected by the sieve p^2 , the cinders passing down through an opening p^3 into any suitable receiver, 5 whilst the smaller particles are collected in p^4 , to be taken therefrom as required through the door p^5 ; q is a receiver for the ashes from the chamber p^4 , and lime to be mixed therewith, and the ashes or mixture with lime taken from the depôt q are then put in daily, or it may be by self-acting machinery, through the openings s^1 ; l , upper closet without pan, the fæces from which 10 fall to the receptacle or depôt s ; the same also takes place in respect of the two other closets l^1 and l^2 ; v^1 is a ventilating tube running from the receptacle s to the eaves or other upper part of the building.

The Drawing, Figure 12, is a collateral plan for deodorizing, solidifying, and utilizing all the liquid sewage of houses, whether overflowing from closets, or 15 thrown from bedrooms, wash-houses, &c.

The pipes, with proper traps upon them, convey all these liquids from small sinks and closets upstairs, &c. into large sinks supplied with the deodorizing and solidifying materials, or when the level suits, into a tank or sink on wheels to be drawn off at times by horse power, or otherwise, and replaced by another; 20 the overflow, if any, always to find its way to the sewers fully deodorized and harmless. And these appliances or means for one entire house or series of houses may, when desired, be connected together for streets and other blocks of buildings.

Having thus described the nature of my said Invention, and in what 25 manner I carry the same into effect, I would have it understood, that what I claim is, the combination and adaptation of means for utilizing and deodorizing the sewage matters of dwelling houses and other places, substantially as explained.

In witness whereof, I, the said John Lloyd, have hereunto set my hand 30 and seal, this Twenty-third day of December, in the year of our Lord One thousand eight hundred and fifty-seven.

JOHN LLOYD. (L.S.)

Witness,

WILLIAM WILLIAMS.

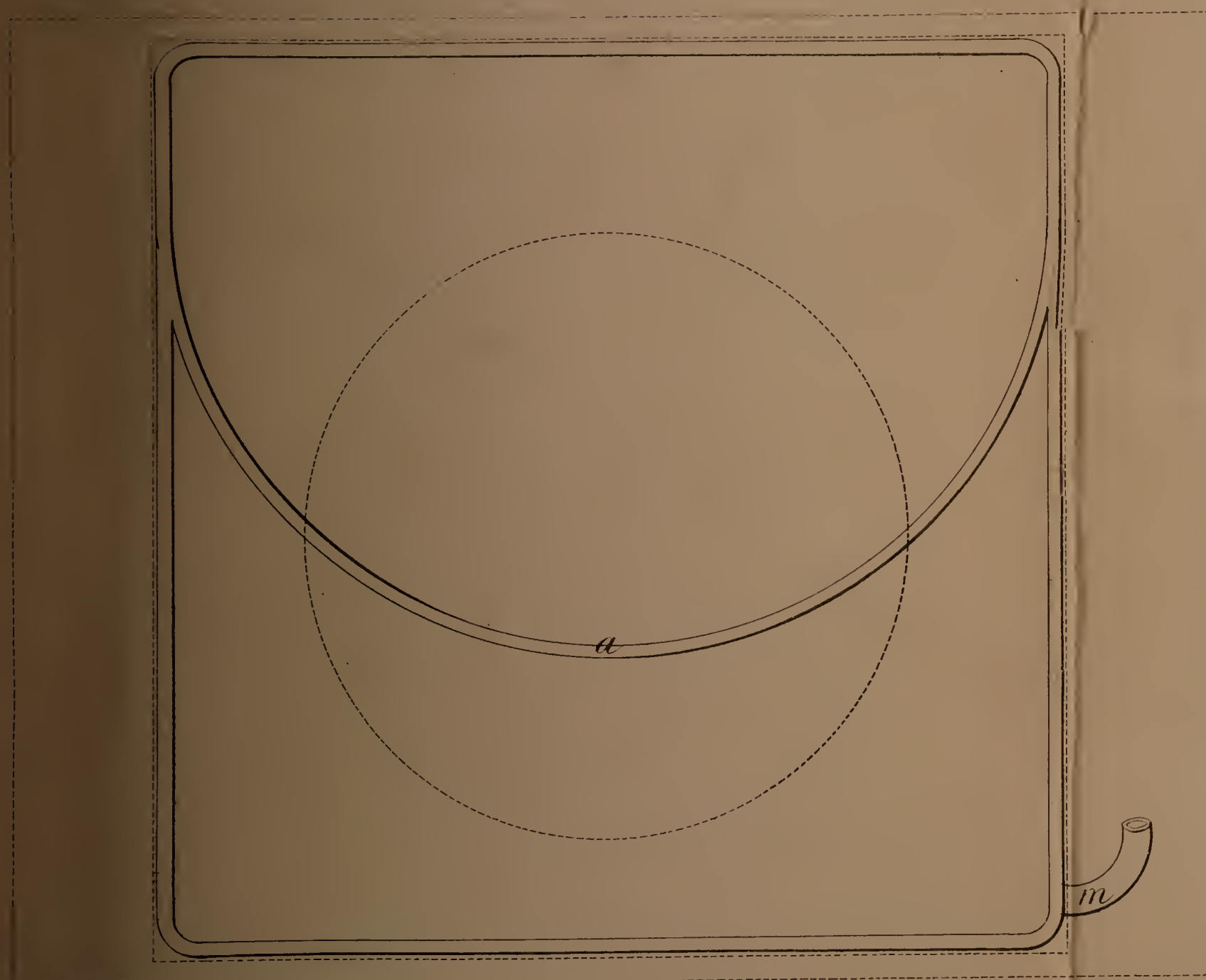
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Printers to the Queen's most Excellent Majesty. 1857.

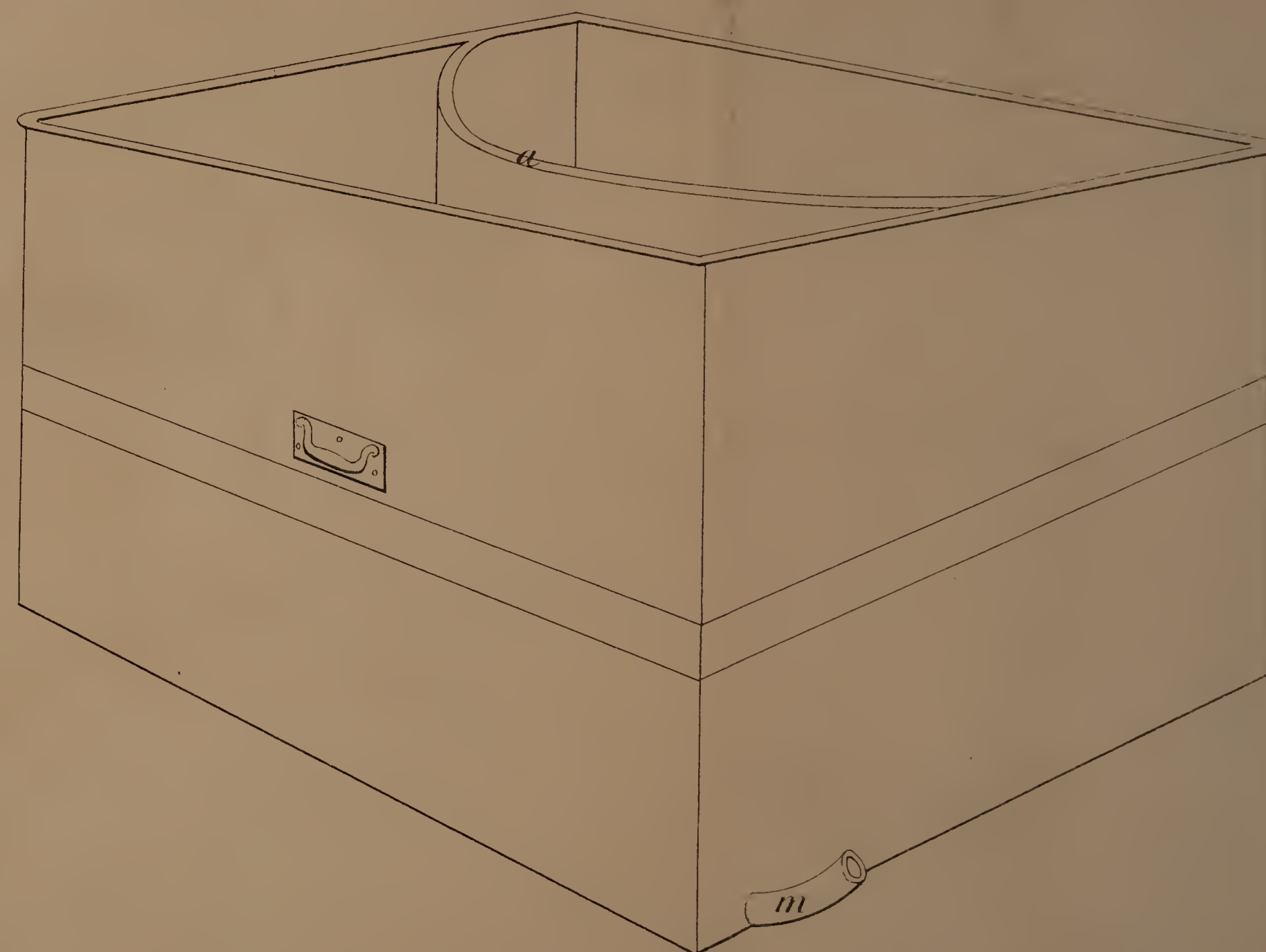
13
A.D. 1857. JUNE 26. N° 1793.
LLOYD'S SPECIFICATION.

SHEET 1.
(3 SHEETS)

F I G . 1 .



F I G . 2 .



The filed drawing is not colored.

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LLOYD'S SPECIFICATION.

FIG. 4.

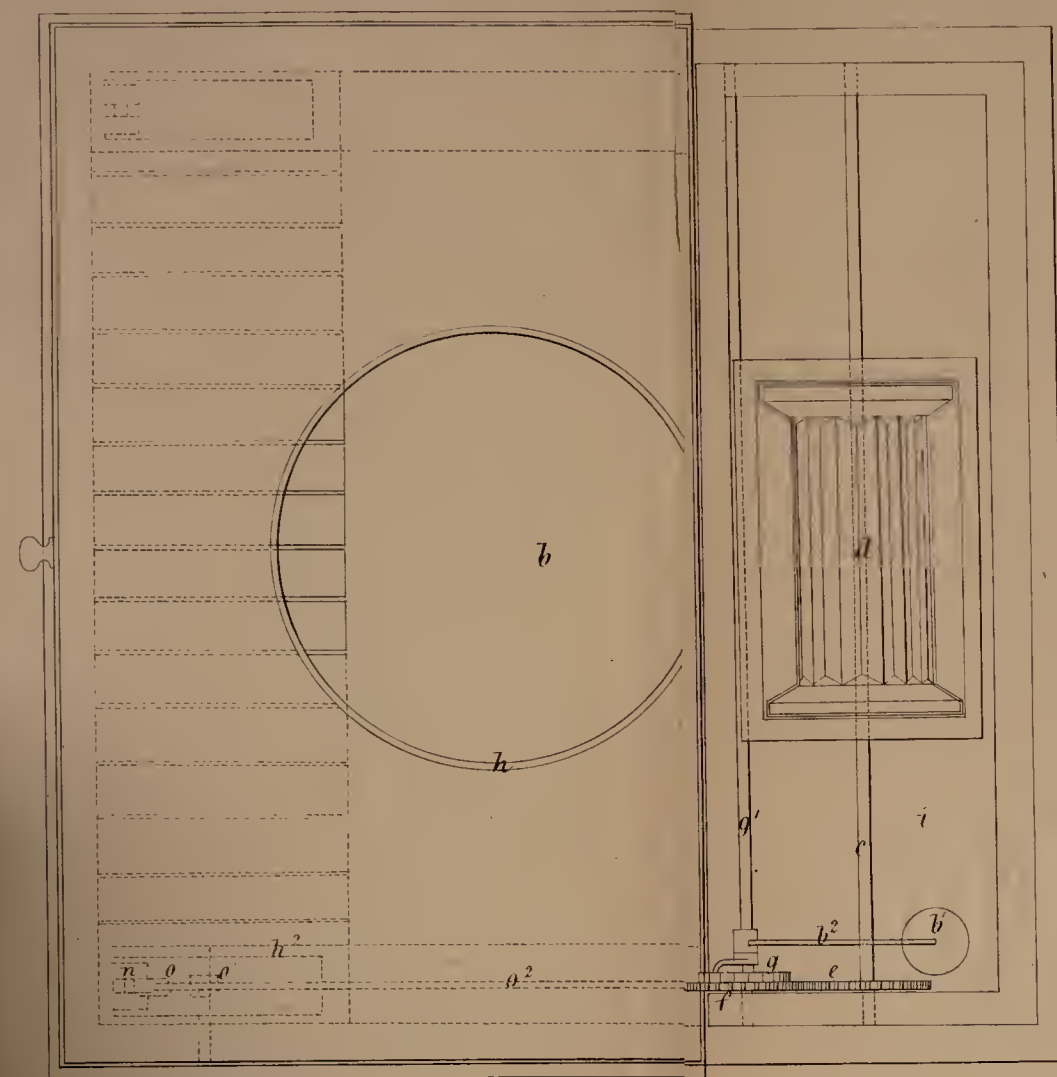


FIG. 9.

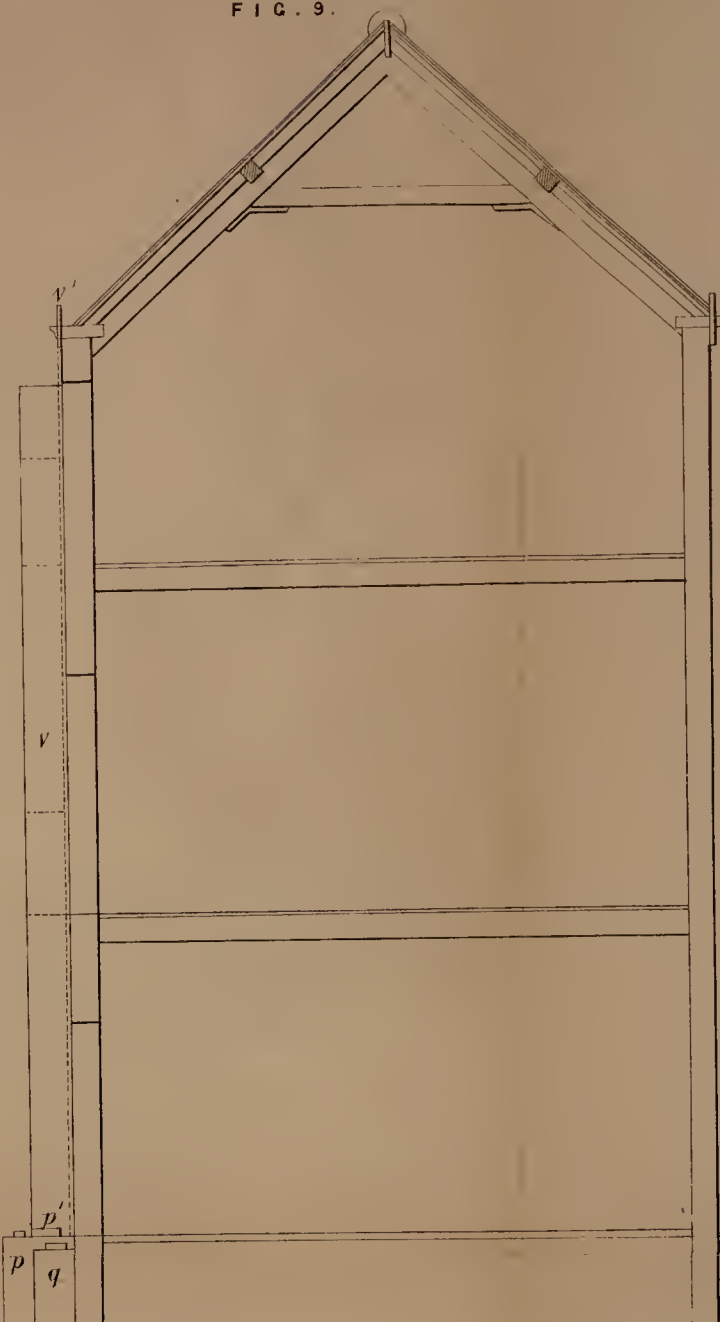


FIG. 10.

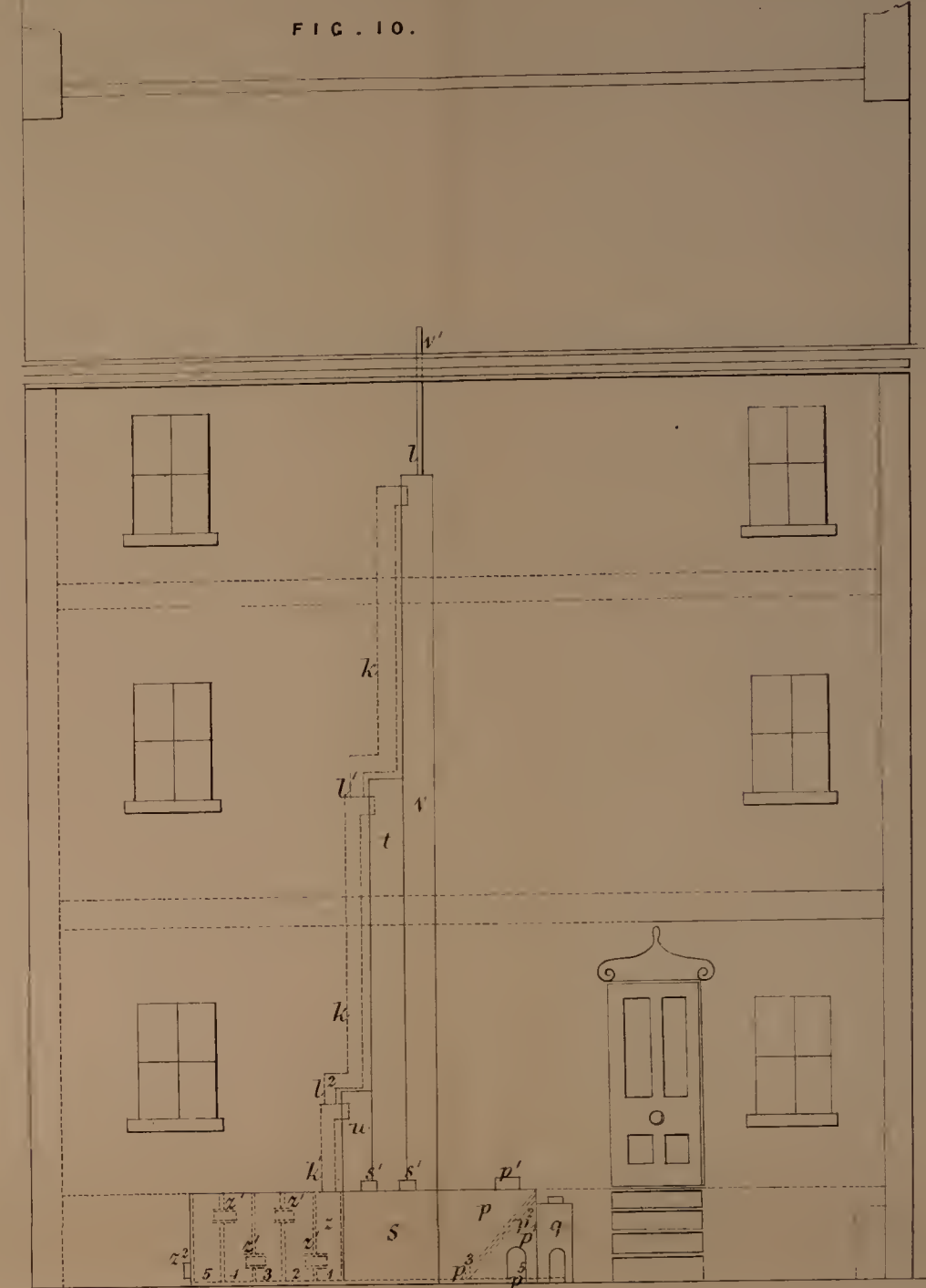


FIG. 3.

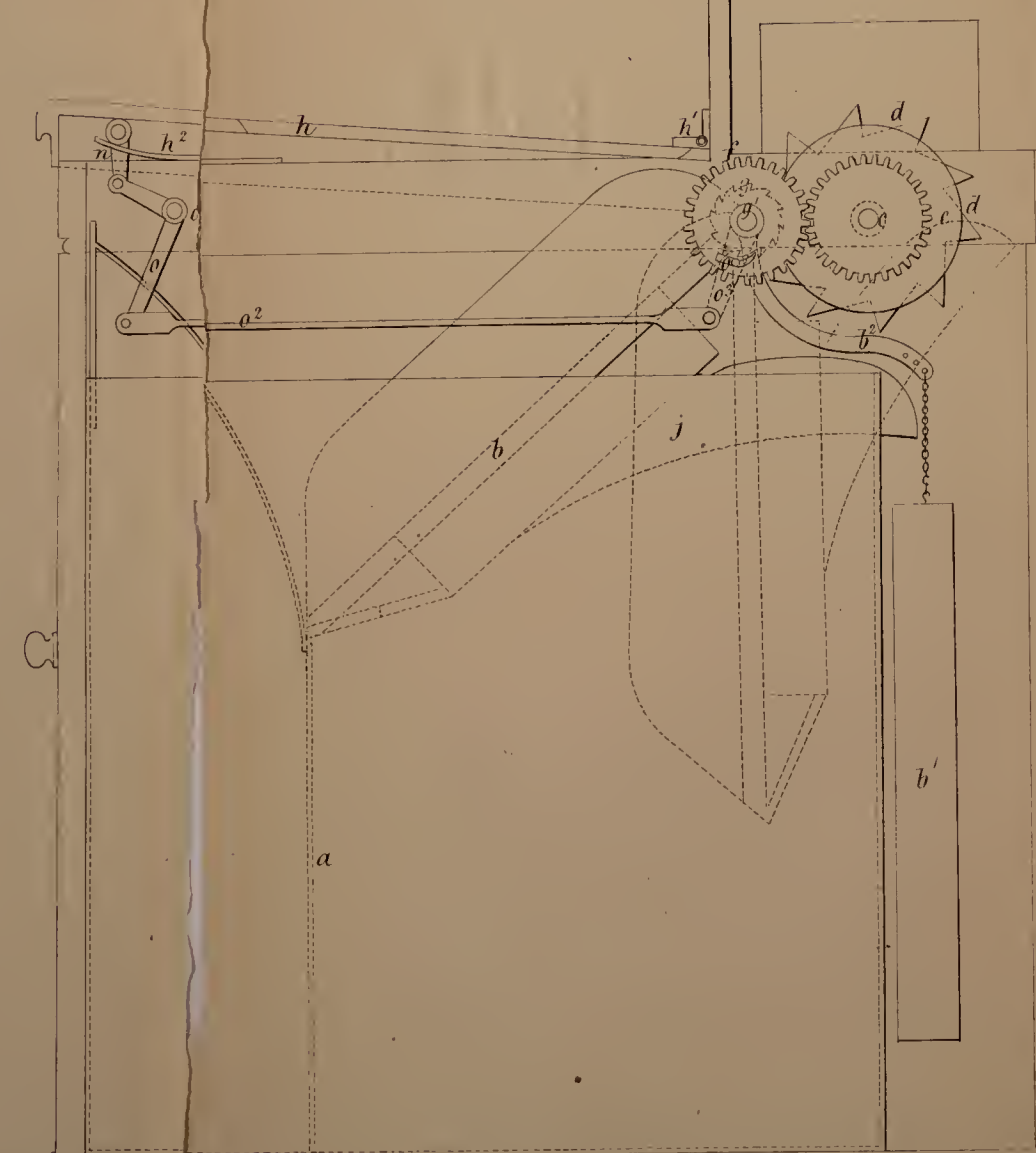


FIG. 5.

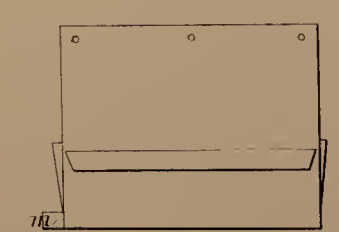


FIG. 6.

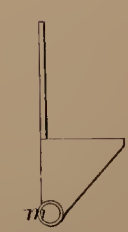


FIG. 7.

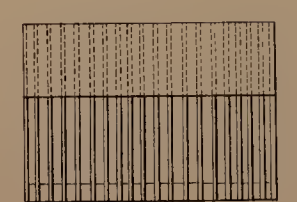
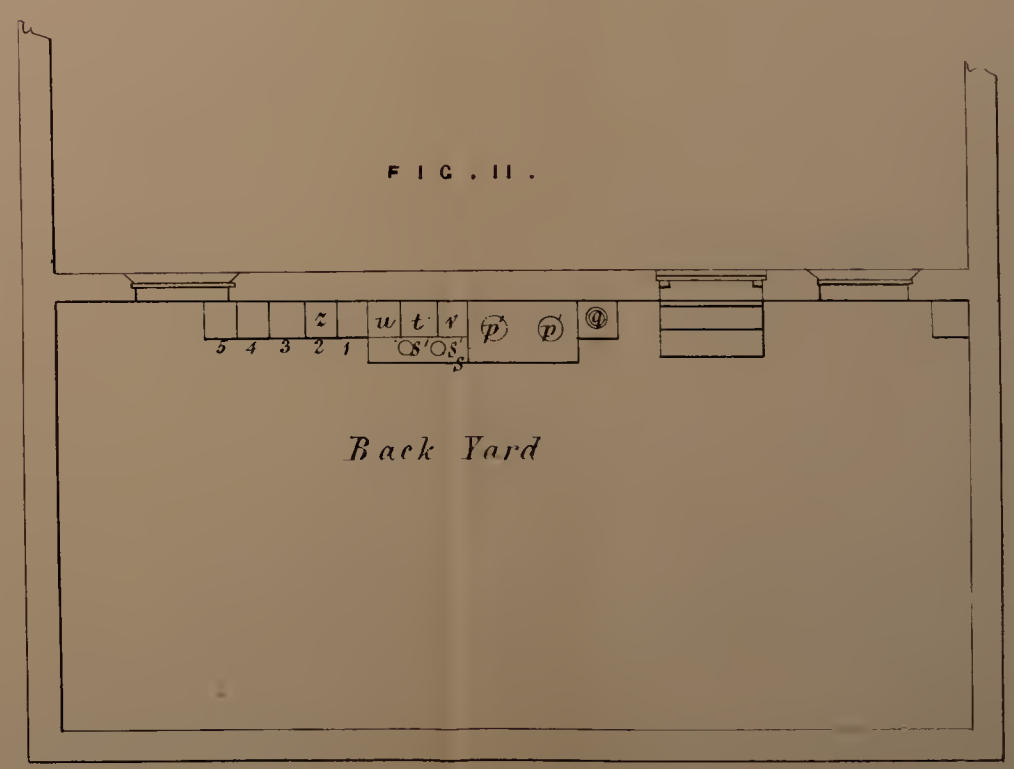


FIG. 8.



FIG. 11.



Back Yard

The filed drawing is not colored.

F I C . 12 .



The tiled drawing is not colored.

Drawn on Stone by Dalby & Sons

